

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

WEATHER SUMMARY FOR MARCH 1889.

Simla, the 17th April 1889.

The month of March usually witnesses the commencement of the hot weather in Central and Northern India. The cold weather rarely lasts later than the middle of March on the Gangetic Plain. Hence it is a month of large change of meteorological conditions, mainly caused by rapid increase of temperature. The distribution of pressure changes considerably. Pressure decreases in the whole Indian area,—most rapidly in Northern India, and least in the Bay of Bengal and Southern India. The area of minimum pressure is usually transferred to the Eastern districts of the Central Provinces and Chutia Nagpur, which determines and accompanies an imperfect cyclonic circulation of the air over that and the adjacent districts.

The atmospheric disturbances of the month of March are usually of a different character from those of the preceding two months. The latter are usually due to the appearance of depressions in Upper India which drift eastwards and always give cloud, and frequently light to moderate rain to the districts near and on the north of the depression. In March the atmospheric disturbances are much more local in character and are chiefly due to the contrasts of conditions produced by the rapidly increasing temperature of the interior. The interaction of land and sea currents and of air motion between the plains and hills give rise to the various classes of storms comprised under the term hot weather storms, which include the nor-wester of Bengal, the thunderstorms and hailstorms of the Gangetic Plain and the adjacent hill districts, and the duststorms of Central and Upper India. Their cause is by no means yet fully understood, nor have the conditions of their occurrence been determined. The month of March is hence a transition month between cold weather and hot weather conditions in Northern India. It is usually a dry month, and the rainfall, which usually occurs, is sometimes due to storms similar to those of the cold weather and sometimes to local series of thunderstorms in the hot weather storms. In at least two cases out of three, when February has been wetter than usual, March is an unusually dry month and characterized by excessive temperature and unusually rapid increase of temperature.

The past month has been an example of a very dry March following an abnormally wet February.

The following gives a brief account of the more important depressions and large atmospheric disturbances of the month.

A shallow depression lay over Sind on the 7th, on which day temperature was 5° above the normal in the Central Provinces. The depression passed rapidly across the head of the Peninsula, and gave rain chiefly as thunder showers in some parts of the Central Provinces, North-Western Provinces, Bengal and Behar. It filled up on the 3rd, and the barometer was very high in Upper India for three or four days afterwards. A very shallow depression formed or appeared in Sind on 13th, but it disappeared on the next day without giving rain. Immediately before this, temperature was excessive in North-Western India. Thus in Sind and Rajputana the mean temperature of the 10th was 7° above the normal of the day, of the Punjab 5° , and of Guzerat and Central India 4° . Another depression appeared in Sind on the 13th and 14th, which was preceded by excessive temperature, viz.:

Punjab 9° above average.
Sind and Rajputana $8\frac{1}{2}^{\circ}$ above average.
Guzerat and Central India $5\frac{1}{4}^{\circ}$ above average : and
North-Western Provinces 5° above average.

It apparently passed across the head of the Peninsula and gave some thunder showers, chiefly in Bengal, Assam, and Burmah.

Another similar disturbance appeared in Sind on the 17th. It gave thunder-storm showers on that day in parts of the Punjab, North-Western Provinces, and Rajputana, and even caused a brief rapid reduction of temperature. Almost immediately afterwards, a depression formed in North Bengal and Behar and the adjacent hill districts. It gave rise to very strong south-westerly winds in South Bengal, and to much cloud, rain, and disturbed weather in the hills. Numerous duststorms occurred in Behar on the 20th, and some thunderstorms in Bengal and Assam on the 21st and 22nd.

After a brief period of rapid increase of temperature lasting until the 25th, a depression again formed in North Bengal under similar conditions to the preceding. It gave few showers, chiefly in Assam, and probably storms in the adjacent hills, and passed away on the 28th, after which ordinary weather prevailed until the end of the month.

Pressure.—The preceding discussion has hence shown that the month was unusually free from large disturbances. The chief feature was the excessive pressure which prevailed and which accompanied, contrary to the usual rule, increased temperature. The mean pressure for the month was '051" above the normal. The excess was greatest at the hill stations, thus showing that the unusual pressure conditions were probably due chiefly to abnormal conditions of the higher strata.

The relative anomalies were smaller than during the previous month. Pressure was relatively in slight defect in Northern India, and in slight excess in the Deccan. In the preceding month the excess in the Deccan was very prominent, but the change initiated by the hot weather conditions of March has already diminished this excess considerably, and hence it will probably pass away entirely during the present hot weather, and conditions more favorable to a strong Bombay monsoon current be established than have obtained during the past two years.

Temperature.—Owing to the absence of any large disturbances during the month the sky was unusually free from cloud, and hence the mean temperature of the month was everywhere above the normal. The greatest excess of temperature was in Sind and Rajputana (+1.9°), but this was closely approached by Bengal and Assam with an excess of 1.8°, and by the Punjab, the Central Provinces and Berars with an excess of 1.7° each. On the whole, the excess of the mean minimum temperature was greater than that of the mean maximum.

Rainfall.—No rain fell throughout the month in the Berars, Khandeish, Guzerat, or the Konkan, and in several other divisions, as will be seen in the following table, the total rainfall of the month was quite insignificant. There was a trifling excess in Rajputana, Sind, and Cutch, but both the actual and the average rainfall for March in those Provinces is very small, and the slight excess reported is unimportant.

The following table shows the actual average rainfall and the normal rainfall of the month of the twenty-one districts into which the country is divided, so far as it is indicated by the telegraphic reports of a few stations in each district:—

Districts.	No. of stations.	Normal average rainfall in March.	Actual average rainfall in March 1889.	Difference from the average in March 1889.
Punjab, West	7	1.49	0.60	—0.89
" East	4	1.18	0.33	—0.85
North-Western Provinces, Trans-Gangetic	7	0.85	0.07	—0.78
" " Cis-Gangetic	3	0.26	0.08	—0.18
Behar	2	0.53	0.53	0
North Bengal	3	1.11	0.17	—0.94
Assam—Cachar	3	5.58	3.75	—1.83
Lower Bengal and Chutia Nagpur	8	1.98	0.49	—1.49
Orissa—North Circars	5	0.73	0.01	—0.72
Central Provinces, South	7	0.35	0.10	—0.25
Berar—Khandeish	2	0.33	0	—0.33
Rajputana, Central India, Saugor, and Nerbudda	9	0.12	0.22	+0.10
Sind—Cutch	3	0.15	0.34	+0.19
Guzerat	3	0.02	0	—0.02
Konkan	4	0	0	0
Deccan—Hyderabad	5	0.28	0.11	—0.17
Malabar	5	0.65	0.22	—0.43
Mysore—Bellary	4	0.98	0.95	—0.03
Carnatic	6	0.36	0.10	—0.26
Lower Burma	7	0.13	0.19	+0.06
Ceylon	1	4.91	1.67	—3.24

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